

### **REMARKS**

By this amendment, claim 3 has been canceled. Claims 1, 4, 5, 6, 9 and 10 have been amended. Claims 1-2 and 4-10 remain in the application. Support for the amendments to the claims can be found the specification and drawings. No new matter has been added. Reconsideration, and allowance of the application, as amended, is respectfully requested.

### **Rejection under 35 U.S.C. §103**

Claim 1 recites an active vibration isolation system arranged to isolate a payload (39) from earth movements, said payload (39) being supported by means of at least one spring (43) and used as an inertial reference mass, said system comprising:

- a mass (41) supporting said payload (39) by means of said at least one spring (43) and being supported by a base body (16;51) via a further spring (45);

- a sensor (59) for sensing a displacement of said payload (39) relative to said mass (41) and generating a displacement signal, wherein the displacement signal is an indication of the change of distance (d2) between the payload (39) and said mass (41);

- a controller (49) for receiving said displacement signal and generating a control signal based on said displacement signal; and

- an actuator (47) arranged in parallel with the further spring (45) between said mass (41) and said body (16; 51), said actuator (47) for generating an actuation force based on said control signal, and applying said actuating force to said mass (41).

Support for the amendments to claim 1 (as well as for amendments to claim 9), can be found in the specification at least on page 3, lines 16-18 and 25; and page 5, lines 11-24, as originally filed.

Claims 1-5 and 8-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Schubert** et al., '307 (U.S. Pat. No. 5,823,307) in view of **Kienholz** '202 (U.S. Pat. No. 6,942,202). With respect to claim 3, the same has been canceled herein, thus rendering the rejection thereof now moot.

With respect to claim 1, as amended herein, Applicant respectfully traverses this rejection on the grounds that these references are defective in establishing a prima facie case of obviousness.

As the PTO recognizes in MPEP § 2142:

*... The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness...*

It is submitted that, in the present case, the examiner has not factually supported a prima facie case of obviousness for the following reasons.

#### **1. Even When Combined, the References Do Not Teach the Claimed Subject Matter**

The **Schubert** and **Kienholz** references cannot be applied to reject claim 1 under 35 U.S.C. §103 which provides that:

*A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains ... (Emphasis added)*

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, since neither **Schubert** nor **Kienholz** teaches an active vibration isolation system "...arranged to isolate a payload (39) ... used as an inertial reference mass, said system comprising: a mass (41) supporting said payload (39) by means of ... at least one spring (43) and [said mass (41)] being supported by a

base body (16;51) via a further spring (45) ... a *sensor* (59) for sensing a displacement of said payload (39) relative to said mass (41) and *generating a displacement signal* ... [that provides] an indication of the *change of distance* (d2) *between the payload* (39) and *said mass* (41) [supporting said payload (39)]; a *controller* (49) for ... *generating a control signal* based on said displacement signal; and an *actuator* (47) arranged *in parallel with the further spring* (45) *between said mass* (41) and said body (16; 51), ... for generating an actuation force based on said control signal, and *applying said actuating force* to said *mass* (41)” [emphasis added] as is now claimed in claim 1, it is impossible to render the subject matter of claim 1 as a whole obvious, and the explicit terms of the statute cannot be met. Furthermore, in the active vibration isolation system of claim 1, a single sensor (59) senses displacement of the payload (39) relative to a mass (41). Moreover, *no actuator* is needed to control movements of the payload *directly*.

In contrast, **Schubert** teaches a vibration isolation system where two sensors 17 and 26 are provided to measure the absolute velocity of two masses, the payload mass and a small mass. These absolute velocity values are transmitted to a processor and delivered to the piezostack 12,13 for vibration reduction actions. (See Schubert, Figure 1; column 6, lines 8-28; and column 5, lines 35-46). **Schubert** further teaches an isolator 20, which is an elastomer, interposed between the small mass and the payload mass, in order to manipulate the vibration frequency (See Schubert, column 5, lines 7-16). Still further, **Schubert** teaches that the small mass should be one order of magnitude smaller than the payload mass (Schubert at column 1, lines 60-62). Moreover, **Schubert** discloses the motion of the small mass is the primary measurement (Schubert at column 4, lines 39-67), while the motion of the payload mass is a secondary consideration (Schubert at column 2, lines 33-39). However, **Schubert** does not teach or suggest an active vibration isolation system “...arranged to isolate a payload (39) ... used as an inertial reference mass, said system comprising: a mass

(41) supporting said payload (39) by means of ... at least one spring (43) and being supported by a base body (16;51) via a further spring (45) ... a *sensor* (59) for sensing a displacement of said payload (39) relative to said mass (41) and *generating a displacement signal* ... [that provides] an indication of the *change of distance* (d2) *between the payload* (39) and *said mass* (41); a *controller* (49) for ... *generating a control signal* based on said displacement signal; and an *actuator* (47) arranged *in parallel with* the further spring (45) *between* said mass (41) and said body (16; 51), ... for generating an actuation force based on said control signal, and *applying* said *actuating force* to said *mass* (41)” as is specifically recited in claim 1 of the present application.

In further contrast, **Kienholz** teaches a compact hybrid pneumatic-magnetic isolator-actuator, in the form of a uniaxial strut, capable of large force, substantial stroke and bandwidth actuation. (See Kienholz at column 1, lines 19-23 and column 3, lines 49-53). **Kienholz** further teaches that gas pressure applied to a piston is controlled by a pressure servo, the pressure servo including a pneumatic servo-valve, ... and a pressure transducer, all arranged in a feedback loop. “The pressure servo allows the pressure on the piston, and *thus* the *piston force*, to be controlled by an input command signal.” (See Kienholz at column 4, lines 1-9). Furthermore, the “volume of air (or gas) supporting the piston determines the effective *air-spring stiffness applied* by the isolator-actuator *to the payload*.” [emphasis added] (see Kienholz at column 8, lines 25-27). However, **Kienholz** does not teach or suggest an active vibration isolation system “...arranged to isolate a payload (39) ... used as an inertial reference mass, said system comprising: a mass (41) supporting said payload (39) by means of ... at least one spring (43) and being supported by a base body (16;51) via a further spring (45) ... a *sensor* (59) for sensing a displacement of said payload (39) relative to said mass (41) and *generating a displacement signal* ... [that provides] an indication of the *change of distance* (d2) *between the payload* (39) and *said mass* (41); a *controller* (49) for ...

*generating a control signal* based on said displacement signal; and an *actuator* (47) arranged *in parallel with* the further spring (45) *between* said mass (41) and said body (16; 51), ... for generating an actuation force based on said control signal, and *applying* said *actuating force* to said *mass* (41)” as is specifically recited in claim 1 of the present application.

Thus, for this reason, the examiner’s burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

## 2. The Combination of References is Improper

Assuming, arguendo, that the above argument for non-obviousness does not apply (which is clearly not the case based on the above), there is still another compelling reason why the **Schubert** and **Kienholz** references cannot be applied to reject claim 9 under 35 U.S.C. §103.

§ 2142 of the MPEP also provides:

*...the examiner must step backward in time and into the shoes worn by the hypothetical ‘person of ordinary skill in the art’ when the invention was unknown and just before it was made.....The examiner must put aside knowledge of the applicant’s disclosure, refrain from using hindsight, and consider the subject matter claimed ‘as a whole’.*

Here, neither **Schubert** nor **Kienholz** teaches, or even suggests, the desirability of the combination since neither teaches the specific active vibration isolation system “...arranged to isolate a payload (39) ... used as an inertial reference mass, said system comprising: a mass (41) supporting said payload (39) by means of ... at least one spring (43) and being supported by a base body (16;51) via a further spring (45) ... a *sensor* (59) for sensing a displacement of said payload (39) relative to said mass (41) and *generating a displacement signal* ... [that provides] an indication of the *change of distance* (d2) *between* the *payload* (39) and *said mass* (41); a *controller* (49) for ...

*generating a control signal* based on said displacement signal; and an *actuator* (47) arranged *in parallel with* the further spring (45) *between* said mass (41) and said body (16; 51), ... for generating an actuation force based on said control signal, and *applying* said *actuating force* to said *mass* (41)” as is specified above and as claimed in claim 1. In addition, in the active vibration isolation system of claim 1, a single sensor (59) senses displacement of the payload (39) relative to a mass (41). Furthermore, *no actuator* is needed to control movements of the payload *directly*.

Thus, it is clear that neither reference provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. §103 rejection.

In this context, the MPEP further provides at § 2143.01:

*The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.*

In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. In the present case it is clear that the combination as suggested by the office action arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 1. Therefore, for this reason, the examiner’s burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Accordingly, claim 1 is allowable and an early formal notice thereof is requested. Claims 2 and 4, 5 and 8 depend from and further limit independent claim 1, in a patentable sense, and therefore are allowable as well. The 35 U.S.C. §103(a) rejection thereof has now been overcome. Withdrawal of the rejection is requested.

By this amendment, claim 9 has been amended in a similar manner as with respect to the amendments to claim 1. Accordingly, claim 9 is believed allowable for at least the same reasons as those presented herein above with respect to overcoming the rejection of claim 1. Claim 10 depends from and further limits independent claim 9, in a patentable sense, and is therefore allowable as well. The 35 U.S.C. §103(a) rejection has now been overcome. Withdrawal of the rejection is requested.

Claims 6 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Schubert** in view of **Kienholz** as applied to claims 1-3, and further in view of **Hornung et al.** (U.S. Pat. No. 5,390,891). With respect to claims 6 and 7, Applicant respectfully traverses this rejection for at least the following reason. Claims 6 and 7 depend from and further limit allowable independent claim 1, in a patentable sense, and therefore are allowable as well.

### **Conclusion**

Except as indicated herein, the claims were not amended in order to address issues of patentability and Applicants respectfully reserve all rights they may have under the Doctrine of Equivalents. Applicants furthermore reserve their right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or a continuation application.

It is clear from all of the foregoing that independent claims 1 and 9 are in condition for allowance. Claims 2 and 4-7 depend from and further limit independent claim 1, and therefore are allowable as well. Claim 10 depends from and further limits independent claim 9, and is therefore allowable as well.

The amendments herein are fully supported by the original specification and drawings; therefore, no new matter is introduced. An early formal notice of allowance of claims 1, 2 and 4-10 is requested.

Respectfully submitted,  
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